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## (57) Abstract

A perfume composition contains at least 30 % by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1 %. The composition can be used in deodorant products to reduce body malodour sub-lethally, i.e. without significantly affecting the numbers of bacteria present on the skin surface.

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### PERFUME COMPOSITION

The invention relates to a perfume composition containing perfume component(s) which is capable of sub-lethally reducing or preventing body malodour produced from perspiration moisture materials by members of the skin microflora, ie without killing significant numbers of the bacteria present on the skin surface.

Body odour results from the microbial transformation of organic molecules both simple and complex which are constituents of sweat. As well as the pungent undesirable odour that is produced by these reactions some of the by-products may, in some cases cause irritation to the skin.

It has been suggested in the prior art that body odour can be reduced by using various different materials, for example;

- 1) Astringent agents such as aluminium salts e.g. aluminium chlorohydrate. These components work by reducing or stopping the secretion of perspiration. However these actives denaturize skin proteins, and may alter the thermal balance of the armpit.
- 2) The topical application of antimicrobial substances to the skin. Bactericidal agents e.g. ethanol are a non specific mechanism of controlling body odour which as a result kill without any degree of discrimination of the micro-organisms present on the skin. Organisms that are not responsible for malodour are killed to the same extent or worse than their malodorous counterparts.
- 3) Perfumes may be applied to mask the odour, but new generation perfumes have been disclosed which exhibit an active deodorant effect on the underarm skin flora. EP-B-3172, EP-A-5618, US-A-43044679, US-A-4322308, US-A-4278658, US-A-4134838, US-A-4288341 and US-A-4289641 all describe perfume compositions which exhibit a deodorant action when applied to human skin, or when included in a laundry product used to launder textiles.

The present generation of deodorants offer protection against body malodour by reducing the numbers of the bacterial microflora considerably without any degree of selective discrimination.

Coryneform bacteria found on human skin have been shown to carry out the incomplete biotransformation of organic molecules secreted in human sweat. Leyden, J.J. et al, "The microbiology of human axilla and its relationship to axillary odour", J. of Invest. Derm., 77(1981), 413-416. Coryneform bacteria have also been shown to be responsible for the production of various odorous metabolites. J. Soc. Cosmet. Chem., 34 (1982), 193-202.

The present invention is directed to a perfume composition and the use thereof to retard or inhibit the production of malodorous compounds produced, for example by coryneform bacteria present on the skin surface, preferably without killing significant numbers of the bacteria, and/or other members of the skin microflora.

Accordingly, the present invention provides a perfume composition comprising at least 30% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%.

The invention further provides a perfume composition comprising at least 30% by weight of one or more of the following perfume components;

(Z)-3,4,5,6,6-pentamethylhept-3-en-2-one, 2,6,10-trimethylundec-9-enal, 1-(4-Methoxyphenyl)-1-propene, diethylcyclohex-2-en-1-one, dimethyl cyclohex-2-en-1-one, Basil comores, 2-methyl-5-(1-methyl-1-ethenyl)-2-cyclohexen-1-one, Cis-3-hexenyl salicylate, methyl 3,3-dimethylbicyclo(2.2.1)heptane-2-carboxylate, Citronellol, Corriander, 2-methyl-3-(4-(1-methylethyl)phenyl)propanal, 1-(2,6,6-trimethyl-1,3-cyclohexadienyl)-2-buten-1-one, Dihydrojasmane, alpha,alpha-Dimethylphenylethylacetate, Dimethyl anthranilate, 1-(2-((1-(ethyloxy)ethyl)oxy)ethyl)benzene, 4-(4-methyl-3-pentenyl)cyclohex-3-ene-1-carbaldehyde, 3-(4-methyl-3-pentenyl)cyclohex-3-ene-1-carbaldehyde, Firneedle, 3-(1,3-benzodioxol-5-yl)-2-methylpropanol,  $\alpha$ -ionone,  $\beta$ -ionone, tricyclo[5.2.1.0 2,6]dec-4-en-8-yl ethanoate, Jasmopyrane forte, 1-methoxy-4-(2-propenyl)-benzene, 2-(1,1-dimethylethyl)cyclohexyl ethanoate, PTBCHA, 2,4-dimethyl-4-phenyltetrahydrofuran, 4-Methyl-2-(2-methylprop-1-enyl)tetrahydropyran, Rosemary Tunisian, 3,6-dihydro-2-phenyl-4-methyl-2H-pyran, Terpinolene extra, Tetrahydro linalol, Thyme white, Ti-tree pure, and Undecalactone gamma.

The invention also provides a cosmetic method for reducing or preventing body malodour by topically applying to human skin a perfume composition comprising at least 30% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%.

The invention also provides a deodorant product comprising a perfume composition defined herein.

The invention also provides the use of a perfume composition, comprising at least 30% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%, to reduce body malodour.

The invention still further provides the use of a deodorant product, comprising a perfume composition which comprises at least 30% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%, to reduce body malodour.

Coryneform is a designation of a large ill-defined group of bacteria. The diverse genera that have been included with the coryneforms include Actinomyces, Arachnia, Arcanobacterium, Arthrobacter, bacterionema, Bifidobacterium, Brévibacterium, Cellulomonas, Corynebacterium, Erysipelothrix, Eubacterium, Kurthia, Listeria, Mycobacterium, Nocardia, Oerskovia, Propionibacterium, Rhodococcus and Rothia.

The term "perfume component" is used herein to represent a material which is added to a perfume to contribute to the olfactive properties of the perfume. A perfume component can be acceptably employed to provide odour contributions to the overall hedonic performance of products. Typically, a perfume component will be generally recognised as possessing odours in its own right, will be relatively volatile and often has a molecular weight within the range 100 to 300. Typical materials which are perfume components are described in "Perfume and Flavour Chemicals", Volumes I and II (Steffan Arctander, 1969). A perfume composition will contain a number of individual perfume components, and optionally a suitable diluent. The concentration of perfume components referred to herein is relative to the total concentration of perfume components present in the composition, ie excludes any diluent.

The perfume composition according to the present invention preferably comprises at least 40%, more preferably at least 50%, particularly at least 60%, and especially at least 70% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria, preferably for *Corynebacteria xerosis* as measured in Example 1 below, of greater than 0.1%. The preferred perfume components preferably have an MIC greater than 0.25%, more preferably greater than 0.5%, and also suitably have an MIC of less than 10%, preferably less than 5%, more preferably less than 3%, particularly less than 2%, and especially less than 1%.

The preferred perfume components have been shown to be capable of a significant deodorant action when used at concentrations below their MIC for coryneform bacteria. The preferred components may be added to other perfume components to deliver perfumes with the desired deodorant and hedonistic properties. The perfume composition suitably comprises up to 70%, preferably up to 60%, more preferably up to 50%, particularly up to 40%, and especially up to 30% by weight of perfume components having an MIC for coryneform bacteria outside of the above preferred ranges. A perfume composition according to the present invention surprisingly provides a perfume with high deodorant activity, but measurably lower anti-microbial effects, particularly against coryneform bacteria. The perfume composition preferably provides deodorant activity without killing significant numbers of the coryneform bacteria, and/or other types of skin bacteria.

A preferred perfume composition yields, an Odour Reduction Value, measured as described in Example 3, of at least 10%, more preferably at least 30%, and particularly at least 50%.

A perfume composition according to present invention may be used in deodorant products which include body deodorants and antiperspirants such as roll ons, gel products, stick deodorants, antiperspirants, shampoos, soaps, shower gels, talcum powder, hand creams, skin conditioners, sunscreens, sun tan lotions, skin and hair conditioners. The

perfume composition may also be used in other product areas to deliver a degree of deodorant protection, for example in laundry and household products such as rinse conditioners, household cleaners and detergent cleaners. The provision of deodorant protection may also be provided in textiles themselves by the incorporation of these perfume compositions during production, using techniques known in the art. A deodorant product preferably comprises at least 0.05% to 4%, more preferably 0.1% to 2% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%, more preferably selected from the list below.

Suitable perfume components, for use in a perfume composition according to the present invention, include the following materials.

- Acetyl di iso amylene ((Z)-3,4,5,6,6-pentamethylhept-3-en-2-one)
- Adoxal (2,6,10-trimethylundec-9-enal)
- Anethole synthetic (1-(4-Methoxyphenyl)-1-propene)
- Azarbre (mixture of diethyl and dimethylcyclohex-2-en-1-one)
- 15 Basil comores
- Carvone laevo (2-methyl-5-(1-methyl-1-ethenyl)-2-cyclohexen-1-one)
- Cis-3-hexenyl salicylate
- Cistulate (methyl 3,3-dimethylbicyclo(2.2.1)heptane-2-carboxylate)
- Citronellol
- 20 Corriander
- Cyclamen aldehyde (2-methyl-3-(4-(1-methylethyl)phenyl)propanal)
- Damascenone (1-(2,6,6-trimethyl-1,3-cyclohexadienyl)-2-buten-1-one)
- Dihydrojasmane
- Dimethyl Benzyl Carbonyl acetate (alpha,alpha-Dimethylphenylethylacetate)
- 25 Dimethyl anthranilate
- Efetaal (1-(2-((1-(ethyloxy)ethyl)oxy)ethyl)benzene)
- Empetaal (mixture of 4-(4-methyl-3-pentenyl)cyclohex-3-ene-1-carbaldehyde and 3-(4-methyl-3-pentenyl)cyclohex-3-ene-1-carbaldehyde)
- Fir needle
- 30 Helional (3-(1,3-benzodioxol-5-yl)-2-methylpropanol)
- Ionone (mixture of  $\alpha$  and  $\beta$  isomers)
- Jasmacyclene (tricyclo[5.2.1.0 2,6]dec-4-en-8-yl ethanoate)
- Jasmpyrane forte
- Methyl chavicol (1-methoxy-4-(2-propenyl)-benzene)
- 35 Ortholate (2-(1,1-dimethylethyl)cyclohexyl ethanoate)
- PTBCHA
- Rhubafuran (2,4-dimethyl-4-phenyltetrahydrofuran)

- Rose Oxide Racemic (4 -Methyl -2 - (2 - methylprop -1-enyl)tetrahydropyran)  
Rosemary Tunisian  
Rosyrane (3,6-dihydro-2-phenyl-4-methyl-2H-pyran)  
Terpinolene extra  
5 Tetrahydro linalol  
Thyme white  
Ti-tree pure  
Undecalactone gamma

- A preferred perfume composition comprises at least 5, more preferably at least 10,  
10 and particularly at least 18 of the above perfume components.

The invention is illustrated by the following examples.

#### **EXAMPLE 1**

##### **Standard assessment of MIC**

- A fresh culture of the test inoculum (*Corynebacteria xerosis* NCTC 7243 (National  
15 Collection of Type Cultures, Public Health Laboratory Service, Central Public Health  
Laboratory , 61 Colindale Avenue, London)) (redeposited on 22 July 1999 under the  
Budapest Treaty as NCIMB 41021 (National Collections of Industrial and Marine Bacteria  
Ltd, 23 St Machar Drive, Aberdeen Scotland) diluted in sterile 0.1% special peptone solution  
to give a concentration of approximately  $10^6$  cfu/ml was prepared.

- 20 Test samples were diluted in sterile trptone soya broth (TSB) Each row of the  
microtitre plate (labelled A - H) was allocated to one sample, i.e. eight samples per plate.  
Row 8 (H) contained only TSB for use as a bacterial control to indicate level of turbidity in  
the absence of test material. Aseptically 200  $\mu$ l of the initial dilution was transferred to the 1st  
and 7th well of the appropriate row. All other test wells were filled with 100  $\mu$ l of sterile TSB  
25 using an 8 channel pipette. The contents of all wells in column 1 were mixed by sucking  
samples up and down pipette tips before 100  $\mu$ l was transferred to column 2. The same  
sterile pipette tips can be used to transfer 100  $\mu$ l of each well in column 7 in to the  
appropriate well in column 8. Tips were discarded into disinfectant solution. Using fresh  
sterile tips the process was repeated by transferring 100  $\mu$ l from column 2 into column 3 (and  
30 8 into 9). The process was continued until all wells in columns 6 and 12 contained 200  $\mu$ l.  
After mixing 100  $\mu$ l was discarded from wells in these columns to waste.

To all wells 100  $\mu$ l of pre-diluted test culture was added giving 200  $\mu$ l final volume in  
each well.

- A blank plate was prepared for each set of samples using the above protocol except  
35 100  $\mu$ l of sterile 0.1% peptone was added instead of bacterial culture.

Plates were sealed using autoclave tape and incubated overnight at 35° C.

The reader was preset to gently agitate the plates to mix the contents before reading

absorbance at 540 nm. The control plate for each set of samples was read first. The reader was then reprogrammed to use the control readings to blank all other plate readings of the set of test materials (i.e. removing turbidity due to perfume and possible colour changes during incubation) thus only printing out absorbances due to turbidity resulting from bacterial growth. Limits were set so that degrees of turbidity were given a rating.

The MIC was taken as the level of sample required to inhibit growth completely (change in absorbance < 0.2).

### EXAMPLE 2

#### Perfume Formulations

Ingredient	% by Weight	
	Perfume X	Perfume Y
Acetyl di iso amylene	7	5.8
Adoxal		0.4
Amberlyn super PM577	4	
Azarbre	4	
Benzyl acetate extra	8	6.7
Benzyl salicylate	6.5	9.7
Cassis base 345 AB2967		4.2
Cis-3-hexenyl salicylate		2.5
Citral lemarome		0.7
Citronellol pure		14.2
Cyclamen aldehyde		4.2
Dihydro Eugenol	1.5	
Dihydro Jasmone	0.7	
Dimethyl benzyl carbonyl acetate	3	
Diphenyl methane	2	
Dupical		0.4
Empetal	0.4	0.5



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	Perfume X	Perfume Y
Geraniol pure	7	8
Helional		4.2
Ionone	12.5	
Jasmacyclene	2.2	2.5
Ligustral	0.3	
Ligustral 10% DPG AA 1486	2.5	
Lylal	8	12.5
Methyl iso eugenol	4	
Methyl octyl acetaldehyde 10% DPG		1.7
Orange terpenes		0.3
Ortholate		6.7
Para cresyl methyl ether	0.4	
Para tert butyl cyclo hexyl acetate	10	
Phenyl ethyl alcohol	10	10.6
Roseacetone	6	10.6

Perfume Z	
Ingredient	% by weight
Adoxal DEP AA022	4
Benzyl acetate extra	7.5
Benzyl salicylate	8
Cardamon ceylon A pure	2
Cassis base 345 AB 2967	2
Cis 3 hexenyl salicylate	5
Citronellol pure	12
Cyclamen aldehyde	2
Dimethyl Benzyl Carbinyl Acetate	2
Geraniol pure	8

Helional	2
Ionone	6
Ligustral	0.3
Lily aldehyde	6
Lyrar	10
Mandarinal 32048 SAE	4
Methyl iso eugenol	3
methyl octyl acetaldehyde	2.8
ortholate	3
Para cresyl methyl ether	0.4
Phenyl ethyl alcohol	5
Rosacetone	5

**EXAMPLE 3**

The following are typical formulations of deodorant products which are made by methods common in the art.

**Deodorant Sticks**

Ingredient	Content (% by weight)	
	Formulation 1A	Formulation 1B
Ethanol		8
Sodium Stearate	7	6
Propylene glycol	70	12
Perfume	1.5	2
PPG-3 Myristyl ether		28
PPG-10 Cetyl ether		10
Cyclomethicone		34
Silica		
Water	21.5	

**Aerosols**

Ingredient	content (% by weight)	
	Formulation 2A	Formulation 2B
Ethanol B	up to 100	
Propylene glycol	as required	
Perfume	2.5	1.5
Chlorhydrol microdry		31.8
Silicone Fluid DC344		up to 100
Bentone gel IPP		13.65
Irgasan DP300	0.03	
Dimethyl ether	20	
Concentrate		22
Water	23	

**Roll ons**

Ingredient	Content (% by weight)	
	Formulation 3A	Formulation 3B
Ethanol	to 100%	60
Klucel MF		0.65
Cremphor RM410		0.5
perfume	0.5	1
AZTC *	20	
Cyclomethicone	68	
Dimethicone	5	
Silica	2.5	
Water		37.85

\* Aluminium zirconium tetrachlorohydro glycinate

The three perfume compositions of Example 2 were made and tested for deodorant action in an underarm product, using an Odour Reduction Value test generally as described in US-A-4278658, but with the substitution of the perfumed soap by perfumed roll-on product, using the formulation described in Formulation 3B.

- 5 The Odour Reduction Value test was carried out using a panel of 40 Caucasian male subjects. A standard quantity (approximately 0.4g) of a roll-on product containing one of the perfume compositions or an unperfumed control was applied to the axillae of the panel members in accordance with a statistical design.

- 10 After a period of five hours the axillary odour was judged by three trained female assessors who scored the odour intensity on the 0 to 5 scale, as shown below

Score	Odour level	Conc. of aqueous isovaleric acid (ml/l)
0	No odour	0
1	Slight	0.013
2	Definite	0.053
3	Moderate	0.22
4	Strong	0.87
5	Very Strong	3.57

Average scores for each test product and the control product were then determined and the score for each test product was subtracted from the score for the control product to give the Odour Reduction Value.

Average panel score perfume Y	1.67
Control panel score	2.41
Odour Reduction Value perfume	0.74
Odour Reduction Value as percentage of control score	31%
Difference for significance @95%	0.24
Difference for significance @99%	0.32

Average panel score perfume X	1.91
Control panel score	2.41

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Odour Reduction Value perfume	0.5
Odour Reduction Value as percentage of control score	21%

Difference for significance @95% 0.24  
 Difference for significance @99% 0.32

Average panel score perfume Z	2.05
Control panel score	2.41
Odour Reduction Value perfume	0.36
Odour Reduction Value as percentage of control score	15%

Difference for significance @95% 0.24  
 Difference for significance @99% 0.32

- 5 The perfume composition referred to as X and Y had at least 40% by weight of specific perfume components listed on page 4 above, present, whilst the perfume referred to as Z had at least 30% of such components. Perfume X contained 40%, Y 41%, and Z 34% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%.

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CLAIMS

1. A perfume composition comprising at least 30% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%.
- 5 2. A perfume composition according to claim 1 wherein at least 30% by weight of the perfume components have a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.25%, and preferably less than 10%.
3. A perfume composition comprising at least 30% by weight of one or more of the following perfume components;
- 10 (Z)-3,4,5,6,6-pentamethylhept-3-en-2-one, 2,6,10-trimethylundec-9-enal, 1-(4-Methoxy phenyl)-1-propene, diethylcyclohex-2-en-1-one, dimethylcyclohex-2-en-1-one, Basil comores, 2-methyl-5-(1-methyl-1-ethenyl)-2-cyclohexen-1-one, Cis-3-hexenyl salicylate, methyl 3,3-dimethylbicyclo(2.2.1)heptane-2-carboxylate, Citronellol, Corriander, 2-methyl-3-(4-(1-methylethyl)phenyl)propanal, 1-(2,6,6-trimethyl-1,3-cyclohexadienyl)-2-
- 15 buten-1-one, Dihydrojasmane, alpha,alpha-Dimethylphenylethylacetate, Dimethyl anthranilate, 1-(2-((1-(ethyloxy)ethyl)oxy)ethyl)benzene, 4-(4-methyl-3-pentenyl) cyclohex-3-ene-1-carbaldehyde, 3-(4-methyl-3-pentenyl)cyclohex-3-ene-1-carbaldehyde), Fir needle, 3-(1,3-benzodioxol-5-yl)-2-methylpropanol,  $\alpha$ -ionone,  $\beta$ -ionone, tricyclo[5.2.1.0 2,6]dec-4-en-8-yl ethanoate, Jasmopyrane forte, 1-methoxy-4-(2-
- 20 propenyl)-benzene, 2-(1,1-dimethylethyl)cyclohexyl ethanoate), PTBCHA, 2,4-dimethyl-4-phenyltetrahydrofuran, 4 -Methyl -2 - (2 - methylprop -1-enyl)tetrahydropyran, Rosemary Tunisian, 3,6-dihydro-2-phenyl-4-methyl-2H-pyran, Terpinolene extra, Tetrahydro linalol, Thyme white, Ti-tree pure, and Undecalactone gamma.
4. A perfume composition according to claim 1 comprising at least 30% by weight of one
- 25 or more of the perfume components listed in claim 3.
5. A perfume composition according to any one of the preceding claims which yields an Odour Reduction Value of at least 10%.
6. A cosmetic method for reducing or preventing body malodour by topically applying to human skin a perfume composition comprising at least 30% by weight of perfume
- 30 components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%.
7. A method according to claim 6 wherein the perfume composition comprises at least 30% by weight of one or more of the perfume components listed in claim 3.
8. A method according to either one of claims 6 and 7 wherein the biotransformation,
- 35 preferably by coryneform bacteria, of organic molecules present in human sweat is diminished sub-lethally.
9. A deodorant product comprising a perfume composition defined in claim 1 and/or in

claim 3.

10. The use of a perfume composition, comprising at least 30% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%, to reduce body malodour.
- 5 11. The use of a deodorant product, comprising a perfume composition which comprises at least 30% by weight of perfume components having a minimum inhibitory concentration (MIC) for coryneform bacteria of greater than 0.1%, to reduce body malodour.

# INTERNATIONAL SEARCH REPORT

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**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61K7/32 A61K7/46

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 44 11 664 A (BEIERSDORF AG) 12 October 1995 (1995-10-12) page 2, line 3 - line 8 page 2, line 41 - line 58 page 3, line 50 - line 59 page 4, line 1 - line 25 page 4, line 50 - line 64 examples	1, 2, 6, 8-11
Y	EP 0 731 160 A (TAKASAGO PERFUMERY CO LTD) 11 September 1996 (1996-09-11) page 2, line 33 - line 47 page 3, line 42 - line 49 page 4, line 4 - line 13 page 6, line 15 - line 40 table 1 page 8, line 1 - page 9, line 1	1, 2, 6, 9-11

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

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Date of the actual completion of the international search

9 November 1999

Date of mailing of the international search report

16/11/1999

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

Int tional Application No  
PCT/GB 99/02013

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 89 00042 A (GAF CORP) 12 January 1989 (1989-01-12) page 6, line 11 - line 15  table 1 page 10, line 11 - line 15 table 4	3,9  1,2,4,6, 7,10,11
X Y  A	US 5 554 588 A (BEHAN JOHN M ET AL) 10 September 1996 (1996-09-10) column 2, line 42 -column 5, line 27  column 6, line 20 - line 22 column 6, line 55 - line 57 table 1 examples 5-8	3,9  1,2,4,6, 7,10,11   5
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X Y	WO 96 12467 A (PROCTER & GAMBLE) 2 May 1996 (1996-05-02) abstract  page 4, line 138 -page 5, line 157 page 5, line 166 - line 177 tables 1,2 examples 75-83 claims 1,3,5-8	3,9  1,2,4,6, 7,10,11
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Y	MORRIS J A ET AL: "ANTIMICROBIAL ACTIVITY OF AROMA CHEMICALS AND ESSENTIAL OILS" JOURNAL OF THE AMERICAN OIL CHEMISTS' SOCIETY, 1 May 1979 (1979-05-01), pages 595-603, XP000645444 ISSN: 0003-021X page 595, paragraph 3 page 596, paragraph 2 table III	1,2,4,6, 7,9-11
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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 99/02013

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	US 5 874 070 A (BUCKNER ROBIN YAGER ET AL) 23 February 1999 (1999-02-23)	3,9
P,Y	column 2, line 39 - line 61  column 4, line 49 -column 6, line 50 column 10, line 40 - line 43 column 11, line 12 - line 14 claim 1	1,2,4,6, 7,10,11
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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 99/02013

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☒ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
See FURTHER INFORMATION sheet PCT/ISA/210
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

## Continuation of Box I.2

Present claims 1,2,4-11 relate to a composition, a method, a product and a use defined by reference to the parameter "a minimum inhibitory concentration (MIC) for Coryneform bacteria of greater than 0.1%". The use of this parameter in the present context is considered to lead to a lack of clarity within the meaning of Article 6 PCT, because it is not clear to which unit such percentage corresponds. It is impossible to compare the parameter the applicant has chosen to employ with what is set out in the prior art. The lack of clarity is such as to render a meaningful complete search impossible. Consequently, the search has been restricted to the compounds enumerated in claim 3, to perfume products having antibacterial activity against Coryneform bacteria, obvious variants thereof and the general idea underlying the application.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/02013

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